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(54) **Gear drive apparatus for karts**

(57) Conventionally karts are driven by chain drives. Such arrangements require constant adjustement and have a short working life. Gear drive apparatus for karts comprises a support bracket 1 for attachment to a kart chassis 3 and having an axle bracket 6 and an engine 5 support 4. A primary gear casing 16 is attached to the engine 5 and the whole assembly is slidably mounted on the support bracket 1 for engagement with a drive gear casing 8. A primary drive gear on the engine 5 thus engages a drive gear on a carrier 12 which is keyed to the axle of the kart. Replacement engine 5 and primary gear casing 16 assemblies can be easily engaged with the drive gear casing 8.

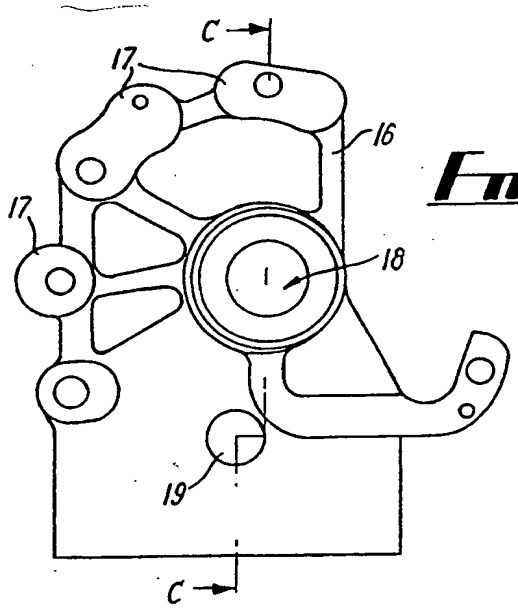
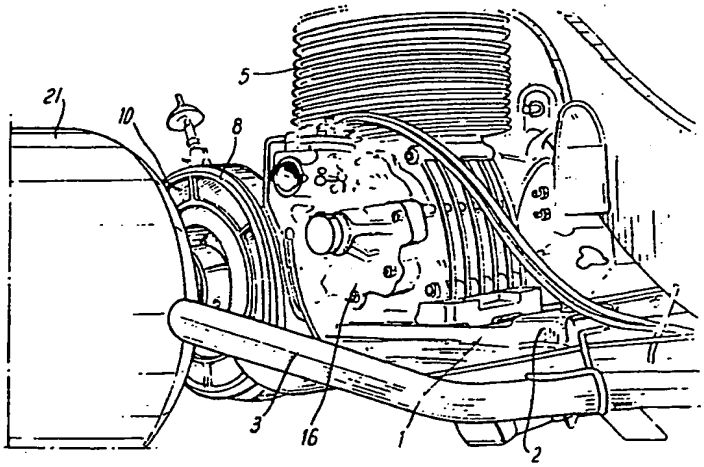


FIG.1

FIG.1a



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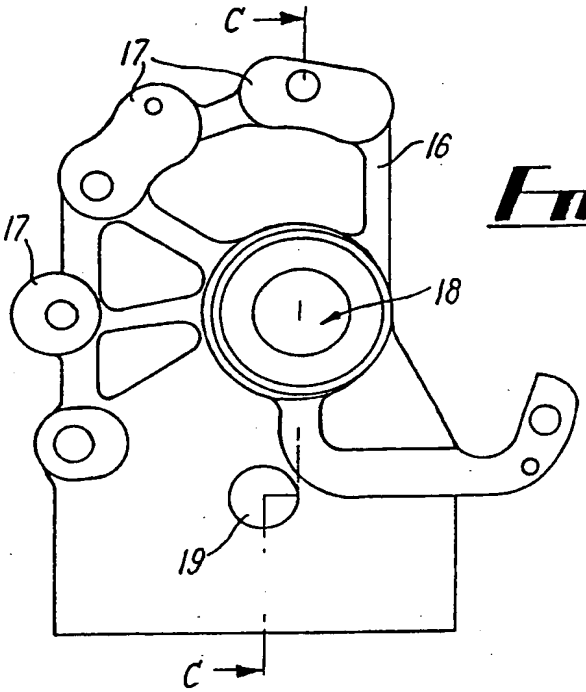

FIG.1

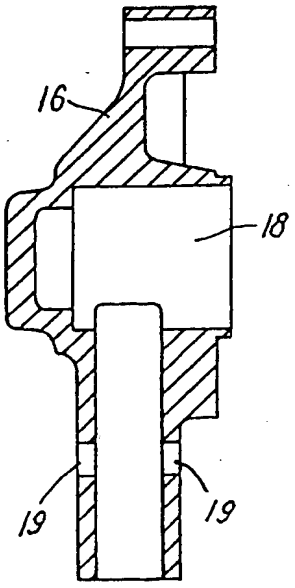

FIG.2

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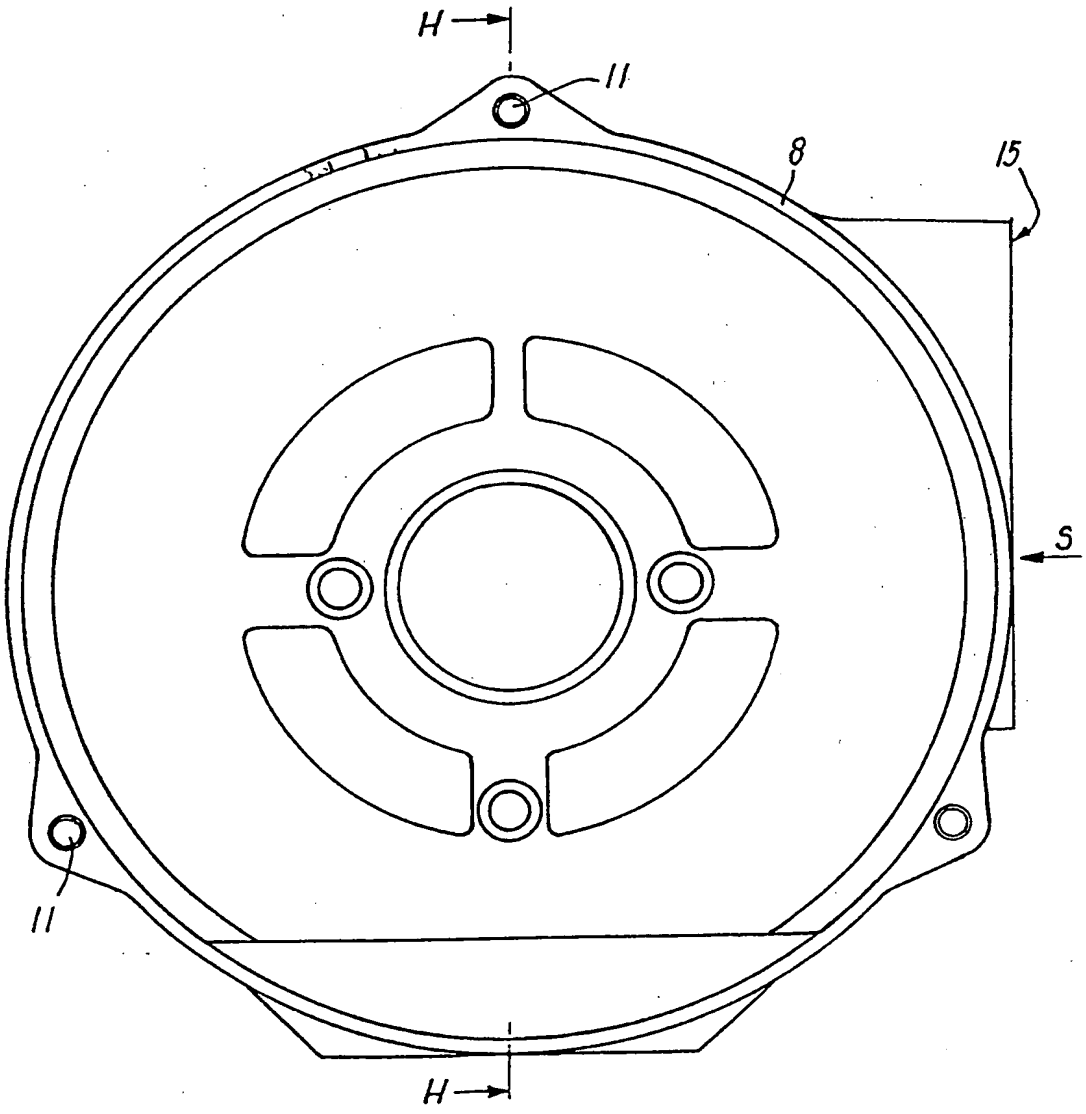

FIG. 3

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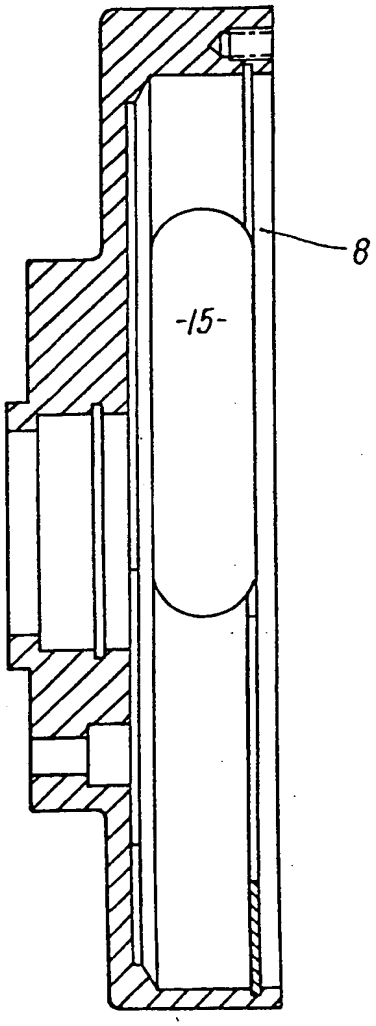

FIG.4

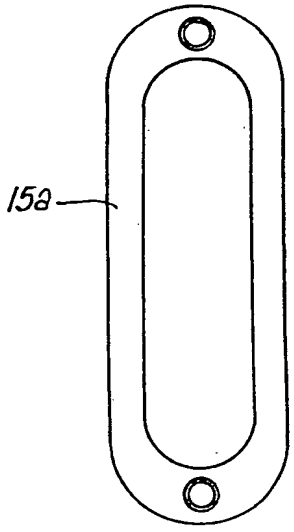

FIG.5

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FIG.7

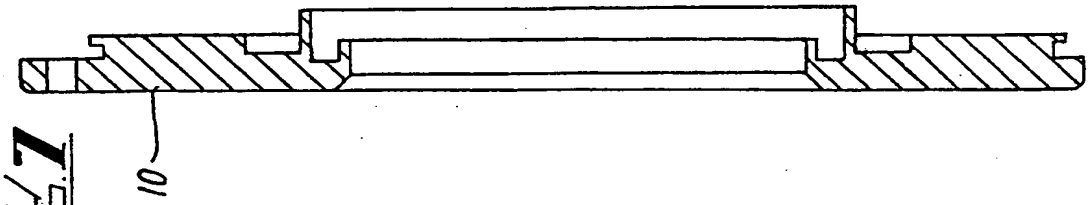
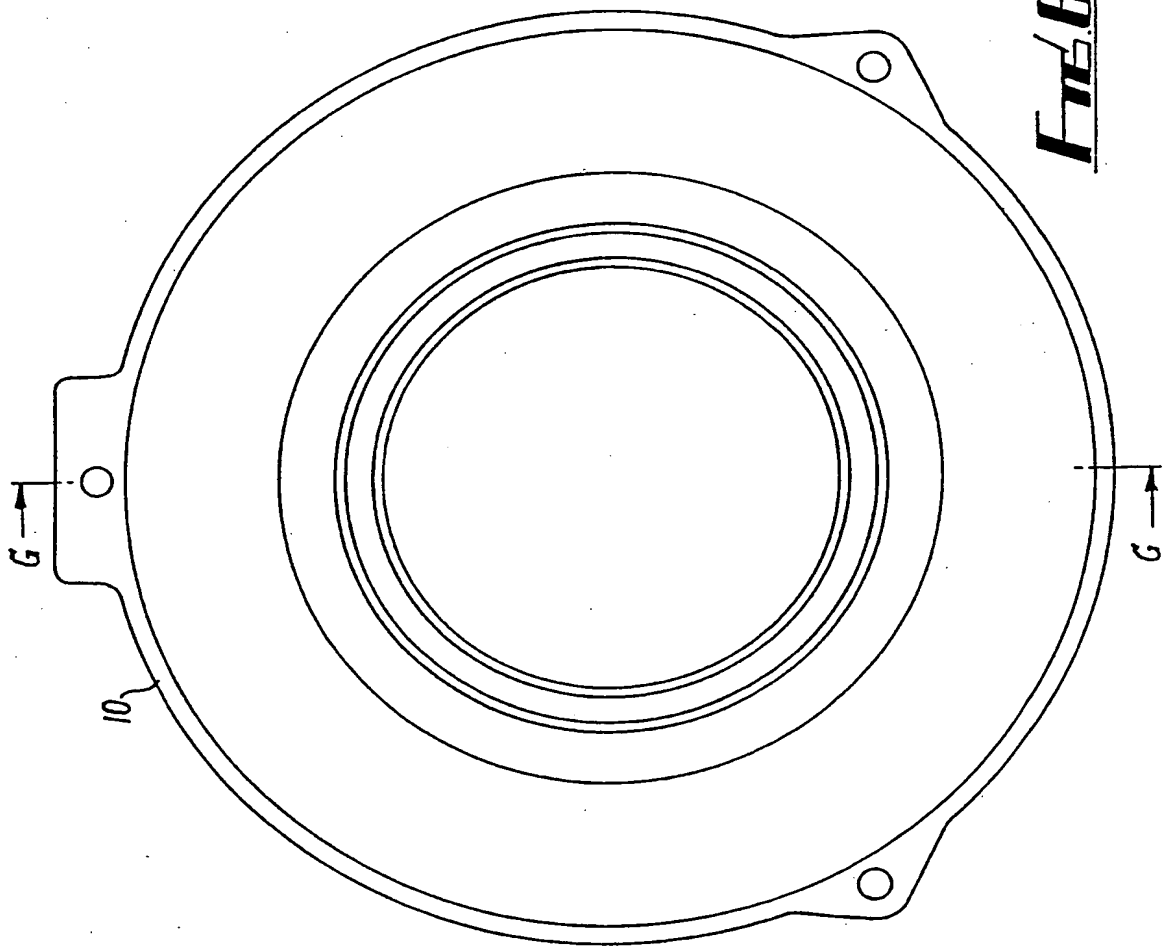


FIG.6



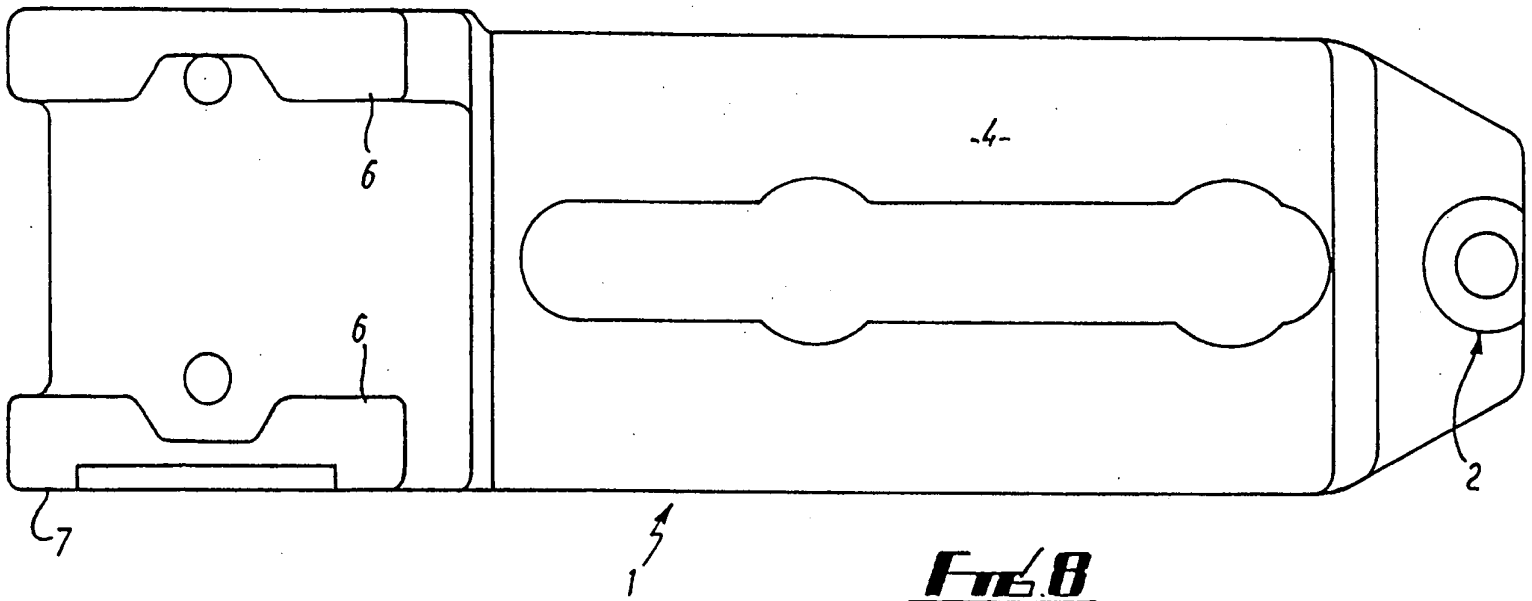


FIG.8

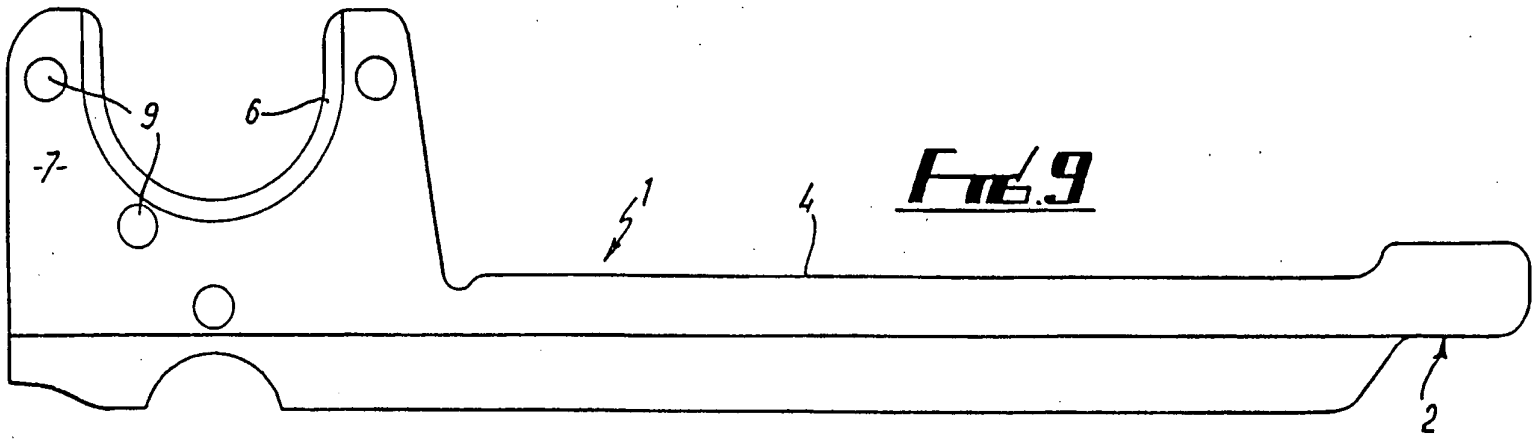


FIG.9

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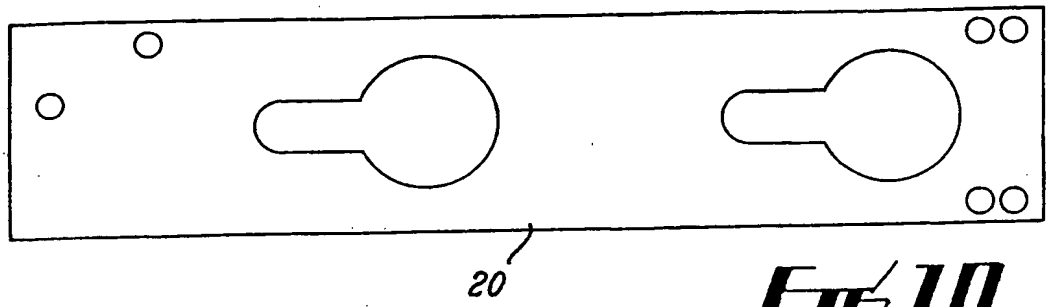

FIG.10

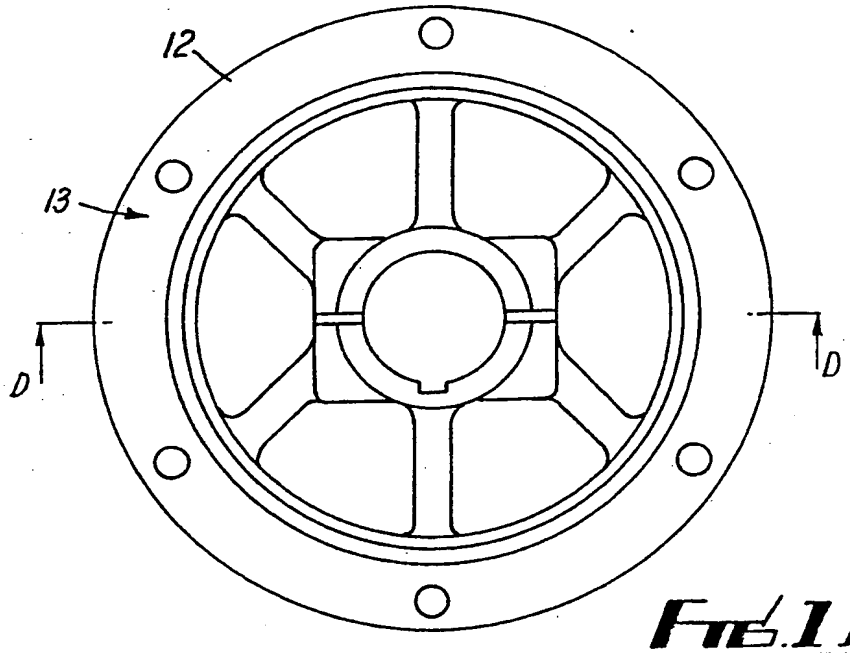

FIG.11

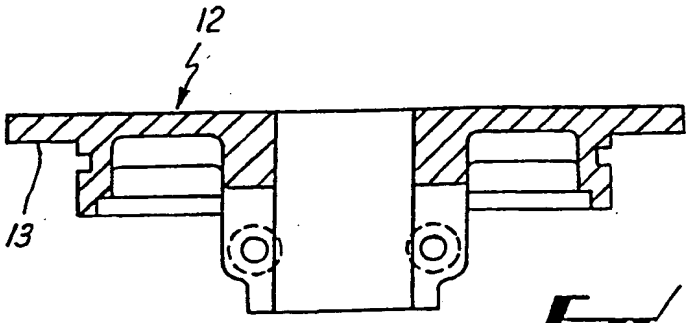

FIG.12

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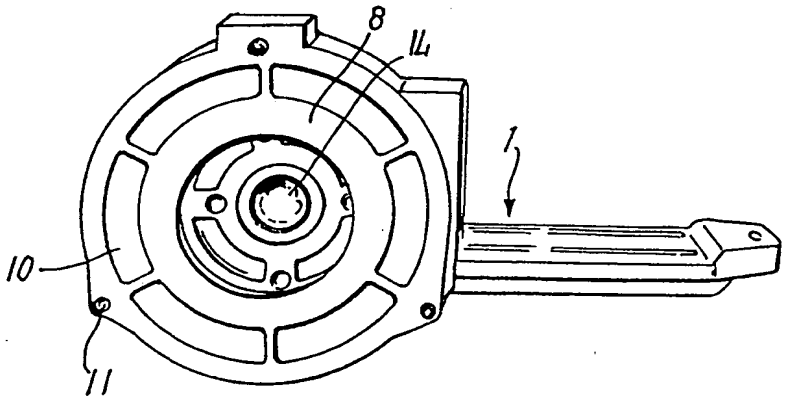

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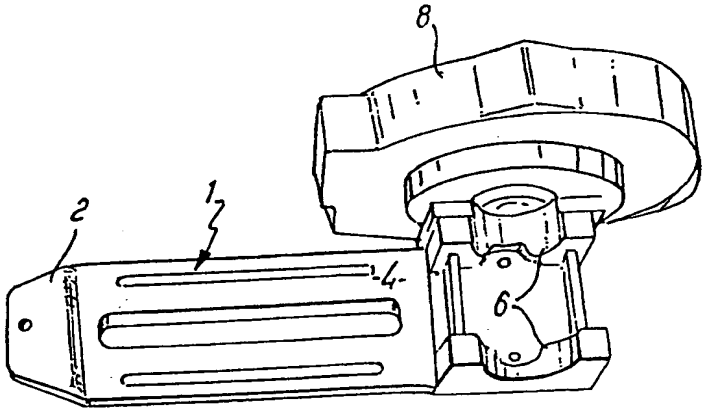

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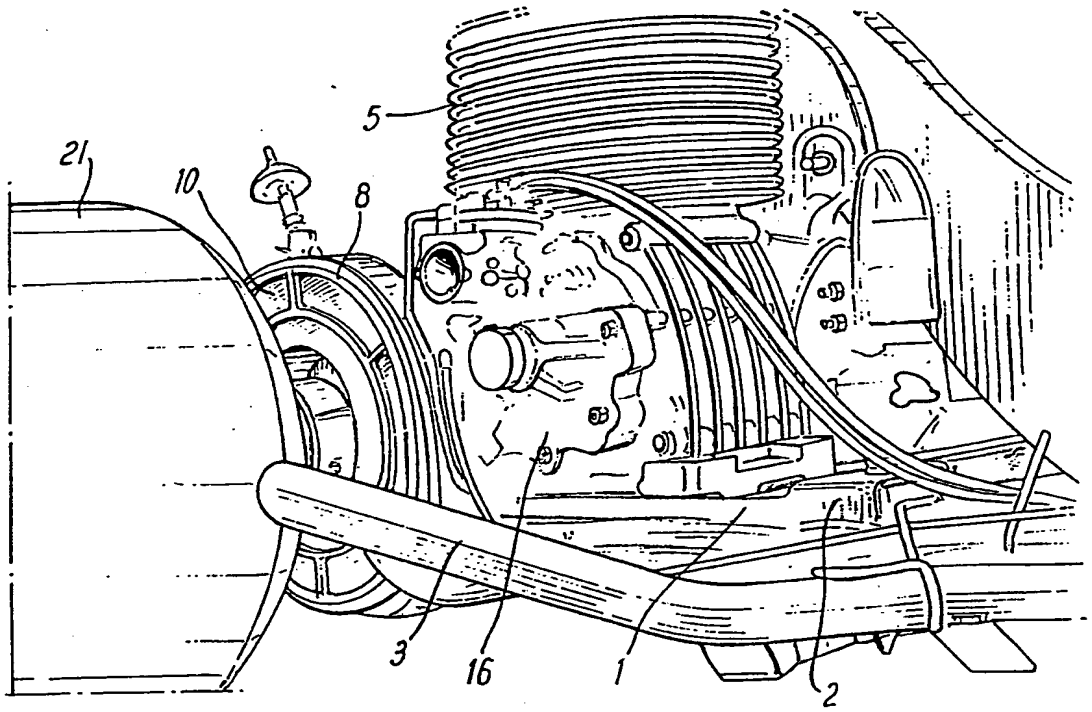

FIG.15

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"Gear Drive Apparatus"

This invention relates to gear drive apparatus for karts.

Conventionally karts are driven by a chain which extends around an engine drive sprocket to a drive sprocket on the rear axle. When such a set up is unworn and carefully adjusted a highly efficient drive transfer is provided. However, in practice a number of factors can combine to lower the efficiency of the drive significantly. The chain becomes worn in use, can be incorrectly adjusted or lubricated, and further losses can arise if the sprockets are not perfectly aligned.

To ensure an efficient drive and to minimise the risk of chain failure, the chain therefore has a limited life in use. In the event of chain failure, severe damage invariably occurs to the carburettor and drive sprockets and the power unit may sustain damage as a result of over-revving.

Some of the problems of chain drives can be overcome by the use of belt dirve systems. Such systems have greater reliability than the chain system but cause a significant

power loss due to the various tensioning systems and because of stretching due to the elasticity of the materials used in the drive belts.

With both these systems there is a necessity to remove the right hand rear wheel when an engine charge is required. This is to provide access to the chain or belt for tensioning and leads to a significant waste of time

According to the present invention there is provided gear drive apparatus for karts comprising a support bracket having means for receiving a prime mover for the kart and means for receiving a rear axle of the kart and a primary gear on the prime mover drivably connected to a drive gear on the rear axle of the kart.

Preferably an idler gear is provided intermediate the primary gear and the drive gear.

Alternatively the drive gear may have internally directed teeth.

Preferably also a carrier is provided for the primary gear, said carrier being adapted for fixing to the prime mover.

Preferably also a housing is provided for the drive gear said housing being adapted for fitment to the support bracket.

Most preferably said primary gear carrier and said drive gear housing are mutually engageable.

Preferably also the prime mover and the primary gear carrier are slidably mounted on the support bracket for adjustment to engage alternative diameters of drive gear.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a side view of a primary gear carrier of drive apparatus of the present invention;
Fig. 2 is a sectional side view of the carrier of Fig. 1 taken on line C-C;
Fig. 3 is a side view of a rear drive casing of gear drive apparatus;
Fig. 4 is a sectional end view of the casing of Fig. 3 taken on line H-H;
Fig. 5 is an end view of part of the casing of Fig. 3 in the direction of arrow S;
Fig. 6 is a side view of a cover for the casing of Fig. 3;
Fig. 7 is a sectional end view of the cover of Fig. 6 taken on line G-G;
Fig. 8 is a plan view of a support bracket of gear drive apparatus;
Fig. 9 is a side view of the support bracket of Fig. 8;
Fig. 10 is a plan view of a fixing bracket of gear drive apparatus;
Fig. 11 is a side view of a rear drive gear carrier of gear drive apparatus;
Fig. 12 is a sectional plan view of the carrier of Fig. 11 taken on line D-D;
Fig. 13 is a side view of gear drive apparatus of the present invention partially assembled;
Fig. 14 is a top perspective view of the gear drive apparatus of Fig. 13;
and
Fig. 15 is a perspective view of part of a kart with gear drive apparatus of the present invention in position.

Referring to the drawings gear drive apparatus for karts comprises a support bracket 1 which has a mounting point 2, for attachment to a kart chasis 3 (Fig 15), a machined area 4 for receiving a prime mover in the form of an engine 5 and an end bracket 6 for supporting an axle of the kart.

The end bracket 6 has a flange 7 to which a drive gear casing 8 is attached by virtue of bolts which extend through holes 9 in the bracket 6.

The drive gear casing 8 has a cover 10 which is retained by screws 11. A drive gear carrier 12 is mounted within the casing 8 and has a flange 13 for receiving a drive gear ring, not illustrated. The casing 8 also provides a location for a bearing 14 for the axle. One side of the casing 8 extends to an opening 15 provided with an apertured cap 15a. The opening 15 is shaped to receive an end portion of a primary gear casing 16.

The primary gear casing 16 is provided with mounting lugs 17 to allow the casing 16 to be fixed to the side of the engine 5. A bore 18 in the side of the casing 16 receives a primary drive gear, not illustrated, which is keyed to the engine 5 crankshaft. An idler gear, not illustrated, engages the primary gear and is supported in the casing 16 by a shaft which locates in holes 19 in the casing 16.

A fixing bracket 20 is also provided. This bracket fits beneath the support bracket 1 and in use the engine 5 is bolted through the support bracket 1 and retained by the fixing bracket 20.

In operation, as illustrated in Fig. 15, the apparatus provides drive for a kart. The engine 5 primary drive gear

drives a drive gear on the drive gear carrier 12 via the intermediate gear. The drive gear carrier 12 is keyed to the axle of the kart and this drive is transmitted to wheels 21 of the kart. A positive connection is thus provided between the engine 5 and wheels 21.

As the axle and rear gear casing are rigidly attached to the main engine mounting bracket, the gears remain correctly in mesh despite the flexing of the chassis caused by acceleration, cornering and braking loads.

A positive stop member ensures that the primary gear casing 16 and drive gear casing 8 are correctly positioned in relation to one another to ensure accurate meshing of the gears.

As the primary gear casing 16 is not fixed to the drive gear casing 8 it is possible to remove the engine 5 and attached primary gear casing 16 quickly and replace them with a similar unit if desired. As described the positive stop member ensures correct positioning of the replacement unit.

An adjustable stop system can be provided to allow presetting of the backlash on different engines thus assisting rapid engine changes.

In addition as the engine 5 and primary gear casing 16 are movable relative to the drive gear casing 8 it is possible to alter the gear ratio by substituting a different drive gear and repositioning the engine 5 and primary gear casing 16 on the support bracket 1. Alternative stop members can be provided if necessary.

The various gears run in oil for lubrication and appropriate seals are therefore provided to ensure that leakage does not

occur from either the primary gear casing 16, or the drive gear casing 8.

The main seal used is a form of labyrinth seal which has the advantage that as there are no touching parts there is nothing to wear out. The seal used between the primary gear casing 16 and the drive gear casing 8 is a conventional rubber seal which allows the parts to be moved fore and aft relative to one another.

The system has a number of advantages when compared to conventional systems. The system provides ease of maintenance and allows for rapid engine changes. The minimal backlash of a gear system as compared to conventional systems provides faster acceleration times, more effective engine braking and a smoother power transmission which is particularly beneficial in wet and slippery conditions. The system is fully enclosed which results in a reduction in noise levels. In addition full enclosure increases safety by avoiding the likelihood of finger injuries and reduces the potential hazard from flying chains, should failure occur.

Modifications and improvements may be incorporated without departing from the scope of the invention.

Clearly if the engine 5 should run in the reverse direction, that is anticlockwise, the intermediate gear is unnecessary. Similarly if the engine 5 is mounted on the opposite side of the kart the intermediate gear is unnecessary.

A further modification which again removes the need for an intermediate gear is the use of an internally cut drive gear with the engine run in reverse.

CLAIMS

1. Gear drive apparatus for karts comprising a support bracket having means for receiving a prime mover for the kart and means for receiving a rear axle of the kart and a primary gear on the prime mover driveably connected to a drive gear on the rear axle of the kart.

2. Gear drive apparatus as claimed in Claim 1, wherein an idler gear is provided intermediate the primary gear and the drive gear.

3. Gear drive apparatus as claimed in Claim 1, wherein the drive gear is provided with internally directed teeth for engagement by the primary gear.

4. Gear drive apparatus as claimed in any one of the preceeding Claims, wherein a carrier is provided for the primary gear said carrier being adapted for fixing to the prime mover.

5. Gear drive apparatus as claimed in Claim 4, wherein a housing is provided for the drive gear said housing being adapted for fitment to the support bracket.

6. Gear drive apparatus as claimed in Claim 5, wherein said primary gear carrier and said drive gear housing are mutually engageable.

7. Gear drive apparatus as claimed in Claim 6, wherein oil sealing means are provided between the primary gear carrier and the drive gear housing.

8. Gear drive apparatus as claimed in Claim 4, 5, 6 or 7 wherein the prime mover and the primary gear carrier are

slidably mounted on the support bracket for adjustment to engage alternative diameters of drive gear.

9. Gear drive apparatus as claimed in Claim 8, wherein stop means are provided to set the position of the prime mover and primary gear carrier on the support bracket so that alternative prime movers and primary gear carriers may be installed.

10. Gear drive apparatus substantially as hereinbefore described, with reference to and as shown in the accompanying drawings.

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